

## Overview of the Preliminary Design of the Optical Communication Demonstration and High-Rate Link Facility

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This paper presents an overview of the preliminary design of both the flight and ground systems of the Optical Communication Demonstration and High-Rate Link Facility. The overview begins with the division of the flight system into subsystems and assemblies according to the heritage architecture of the NASA-patented Optical Communication Demonstrator on which the flight system is based. It continues with a review of the mission factors that drove the design choices, including an estimate of the atmospheric effects on the beacon and communication beams. The overview then proceeds with a summary of the flight subsystem specifications, concentrating on the optical layout of the flight terminal and the design of the laser transmitter. The preliminary design of the ground system beacon beam and receiver channels is then presented, culminating with a summary of the joint performance of the flight system and ground system in terms of data rate, bit-error rate, and link margin. Finally, the timetable for the construction and deployment of the flight and ground systems is outlined.